

WHAT IS CLAIMED IS:

1                   1.       A multicolor display comprising  
2                   a substrate; and  
3                   at least one multicolor generation site coupled to said substrate, each of  
4                   said at least one multicolor generation sites comprised of:  
5                             at least two light emitting regions proximate to one another;  
6                             at least one wavelength conversion layer applied to at least one of  
7                   said at least two light emitting regions, wherein said at least two light emitting  
8                   regions in combination with said at least one wavelength conversion layer emit at  
9                   least two different colors; and  
10                            an opaque material interposed between said at least two light  
11                   emitting regions, said opaque material preventing cross-talk between said at least  
12                   two light emitting regions.

1                   2.       A multicolor display comprising  
2                   a substrate; and  
3                   a multicolor generation site grown on said substrate comprising:  
4                             at least two LEDs proximate to one another;  
5                             a first wavelength conversion layer applied to a light emitting  
6                   surface of a first of said at least two LEDs, wherein said at least two LEDs in  
7                   combination with said first wavelength conversion layer emit at least two different  
8                   colors; and  
9                             an opaque material interposed between said at least two LEDs, said  
10                   opaque material preventing cross-talk between said at least two LEDs.

1                   3.       The multicolor display of claim 2, wherein said at least two LEDs  
2                   are comprised of three individual LEDs proximate to one another.

1                   4.       The multicolor display of claim 3, further comprised of a second  
2                   wavelength conversion layer applied to a light emitting surface of a second of said three  
3                   individual LEDs, wherein said three individual LEDs in combination with said first and  
4                   second wavelength conversion layers emit three different colors.

1                   5.       The multicolor display of claim 2, wherein said at least two LEDs  
2 emit light at a wavelength in the range of wavelengths between 4,000 and 4,912  
3 Angstroms.

1                   6.       A multicolor display comprising  
2 a substrate; and  
3 a plurality of multicolor generation sites grown on said substrate, each of  
4 said plurality of multicolor generation sites comprised of:  
5                   at least two LEDs proximate to one another;  
6                   a wavelength conversion layer deposited on a light emitting surface  
7 of a first of said at least two LEDs, wherein said at least two LEDs in combination  
8 with said wavelength conversion layer emit at least two different colors; and  
9                   an opaque material interposed between said at least two LEDs, said  
10 opaque material preventing cross-talk between said at least two LEDs.

1                   7.       The multicolor display of claim 6, further comprising an index  
2 matching layer interposed between said wavelength conversion layer and said light  
3 emitting surface of said first LED.

1                   8.       The multicolor display of claim 6, further comprising a protective  
2 layer deposited on an exterior surface of said wavelength conversion layer.

1                   9.       The multicolor display of claim 6, further comprising a protective  
2 layer deposited on a light emitting surface of a second of said at least two LEDs.

1                   10.      The multicolor display of claim 6, wherein said substrate is  
2 selected from the group consisting of sapphire, silicon carbide and gallium nitride.

1                   11.      The multicolor display of claim 6, wherein said at least two LEDs  
2 emit light at a wavelength in the range of wavelengths between 4,000 and 4,912  
3 Angstroms.

1                   12.      The multicolor display of claim 6, further comprising a cross-talk  
2 minimization layer interposed between said substrate and said at least two LEDs.

1                   13.     The multicolor display of claim 12, wherein said cross-talk  
2 minimization layer is comprised of a Bragg reflector.

1                   14.     The multicolor display of claim 12, wherein said cross-talk  
2 minimization layer is comprised of a partially absorbing layer.

1                   15.     A multicolor display comprising  
2 a substrate; and  
3 a plurality of multicolor generation sites grown on said substrate, each of  
4 said plurality of multicolor generation sites comprised of:  
5                   three LEDs proximate and immediately adjacent to one another;  
6                   a first wavelength conversion layer deposited on a light emitting  
7 surface of a first of said three LEDs; and  
8                   a second wavelength conversion layer deposited on a light emitting  
9 surface of a second of said three LEDs, wherein said three LEDs in combination  
10 with said first and second wavelength conversion layers emit three different  
11 wavelengths; and  
12                   an opaque material interposed between said three LEDs, said  
13 opaque material preventing cross-talk between said three LEDs.

1                   16.     The multicolor display of claim 15, wherein said substrate is  
2 selected from the group consisting of sapphire, silicon carbide and gallium nitride.

1                   17.     The multicolor display of claim 15, wherein said first and second  
2 wavelength conversion layers are selected from the group of materials consisting of  
3 phosphors and active polymers.

1                   18.     The multicolor display of claim 15, wherein said three LEDs emit  
2 light at a wavelength in the range of wavelengths between 4,000 and 4,912 Angstroms.

1                   19.     The multicolor display of claim 15, wherein said first wavelength  
2 conversion layer converts light in a first wavelength range of between 4,000 and 4,912  
3 Angstroms to light in a second wavelength range of between 4,912 and 5,750 Angstroms.

1                   20.     The multicolor display of claim 15, wherein said second  
2 wavelength conversion layer converts light in a first wavelength range of between 4,000

3 and 4,912 Angstroms to light in a second wavelength range of between 6,470 and 7,000  
4 Angstroms.

1 21. The multicolor display of claim 15, further comprising:  
2 a first index matching layer interposed between said first wavelength  
3 conversion layer and said light emitting surface of said first LED; and  
4 a second index matching layer interposed between said second wavelength  
5 conversion layer and said light emitting surface of said second LED.

1 22. The multicolor display of claim 15, further comprising:  
2 a first protective layer deposited on an exterior surface of said first  
3 wavelength conversion layer; and  
4 a second protective layer deposited on an exterior surface of said second  
5 wavelength conversion layer.

1 23. The multicolor display of claim 22, wherein said first and second  
2 protective layers are equivalent layers.

1 24. The multicolor display of claim 22, further comprising a third  
2 protective layer deposited on a light emitting surface of a third of said three LEDs.

1 25. The multicolor display of claim 15, further comprising a plurality  
2 of channels within said substrate, said plurality of channels separating adjacent LEDs of  
3 said three LEDs, wherein said opaque material is deposited within said plurality of  
4 channels.

1 26. The multicolor display of claim 15, further comprising a cross-talk  
2 minimization layer interposed between said substrate and said at least two LEDs.

1 27. The multicolor display of claim 26, wherein said cross-talk  
2 minimization layer is comprised of a Bragg reflector.

1 28. The multicolor display of claim 26, wherein said cross-talk  
2 minimization layer is comprised of a partially absorbing layer.